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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS 6324 PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 02/14865		International filing date (day/month/year) 31.12.2002	Priority date (day/month/year) 31.12.2001
International Patent Classification (IPC) or both national classification and IPC B23K20/02, B23K20/02			
Applicant SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ...et al			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 16.07.2003		Date of completion of this report 07.04.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer De Backer, T Telephone No. +49 89 2399-7403 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 02/14865**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-18 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-21
	No: Claims	
Inventive step (IS)	Yes: Claims	1-21
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 02/14865

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document/s/:

- D1: US-A-4 669 650 (MOE PER H) 2 June 1987 (1987-06-02)
- D2: US-A-5 721 413 (MOE PER H) 24 February 1998 (1998-02-24)
- D3: US-A-4 736 084 (MOE PER H) 5 April 1988 (1988-04-05)
- D4: US-A-5 163 604 (MOE PER H) 17 November 1992 (1992-11-17)
- D5: US-A-5 770 832 (CARNES ROBERT W ET AL) 23 June 1998 (1998-06-23)
- D6: US-A-4 566 625 (MOE PER H) 28 January 1986 (1986-01-28)

1. The subject-matter of claim 1 is new and inventive (Art. 33(2) and Art. 33(3) PCT):
 - 1.1 Document D1, which is considered to represent the most relevant state of the art, discloses a method for interconnecting tubulars by forge welding from which the subject-matter of claim 1 differs in that use is made of at least three electrodes that are pressed at circumferentially spaced intervals against the wall of each tubular adjacent to the tubular end such that the electrodes transmit a high frequency electrical current in a substantially circumferential direction through the tubular segment between the electrical contacts.
 - 1.2 This differing feature solves the problem of how to improve the quality of the forge weld. Through the differing feature, a more uniform heating of the tubular ends is obtained and as a consequence the quality of the forge weld is improved.
 - 1.3 In document D2 this problem is solved by attaching two diametrically opposed contacts to each end for supplying high frequency alternating current for resistance heating of the material in the respective end portion.
In document D3 this problem is solved by electrically connecting one pole of a source of high frequency alternating current to each element at a point close to the gap surface, and making an electrical connection to said two elements across said gap at points remote from said two poles of said current source to complete the electrical current conducting path and form a high frequency resistance path in the area of the gap surfaces.
In document D4 by providing the bonding surfaces with generally matching corrugations of somewhat different height.

Combining D1 with D2, D3 or D4 does not lead a skilled man to the invention as proposed by the subject-matter of claim 1. Hence the subject-matter of claim 1 is inventive.

2. The subject-matter of claim 20 is new and inventive (Art. 33(2) and Art. 33(3) PCT):

2.1 Document D1, which is considered to represent the most relevant state of the art, discloses a system for use in the method of claim 1, from which the subject-matter of claim 20 differs in that the electrode assembly comprises at least three electrodes that are pressed at circumferentially spaced intervals against the wall of each tubular adjacent to the tubular end such that the electrodes transmit in use a high frequency electrical current in a substantially circumferential direction through the tubular segment between the electrical contacts.

2.2 This differing feature solves the problem of how to improve the quality of the forge weld. Through the differing feature, a more uniform heating of the tubular ends is obtained and as a consequence the quality of the forge weld is improved.

2.3 In document D2 this problem is solved by attaching two diametrically opposed contacts to each end for supplying high frequency alternating current for resistance heating of the material in the respective end portion.
In document D3 this problem is solved by electrically connecting one pole of a source of high frequency alternating current to each element at a point close to the gap surface, and making an electrical connection to said two elements across said gap at points remote from said two poles of said current source to complete the electrical current conducting path and form a high frequency resistance path in the area of the gap surfaces.

In document D4 by providing the bonding surfaces with generally matching corrugations of somewhat different height.

Combining D1 with D2, D3 or D4 does not lead a skilled man to the invention as proposed by the subject-matter of claim 20. Hence the subject-matter of claim 20 is inventive.

3. Claims 2 to 19 and 21 are dependent on claim 1 and 20 respectively and as such also meet the requirements of the PCT with respect to novelty and inventive step.